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(56) Documents Cited

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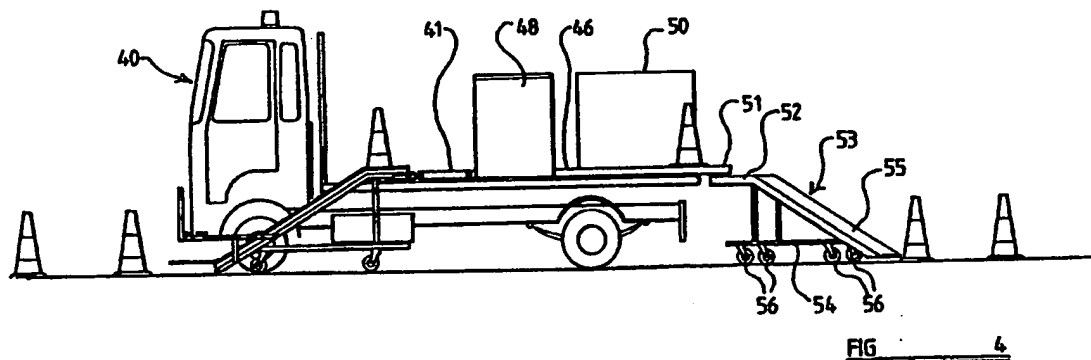
(58) Field of Search

UK CL (Edition L) E1G

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(54) Apparatus for collecting/setting road traffic cones

(57) Apparatus for collecting/setting traffic cones from/on a road surface, comprises conveyor means having a loading station and a discharge station, one station being disposed adjacent the road surface. The apparatus is suitably mounted on a vehicle and may additionally comprise a cleaning station.



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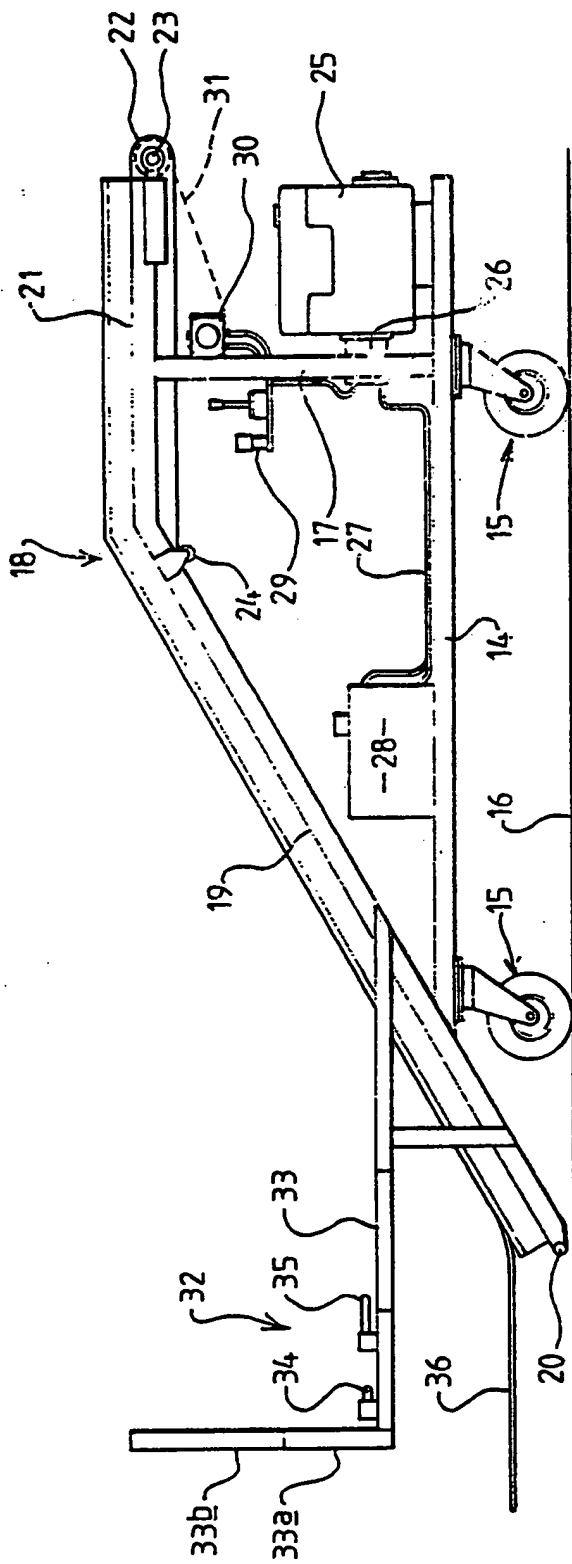


FIG. 1

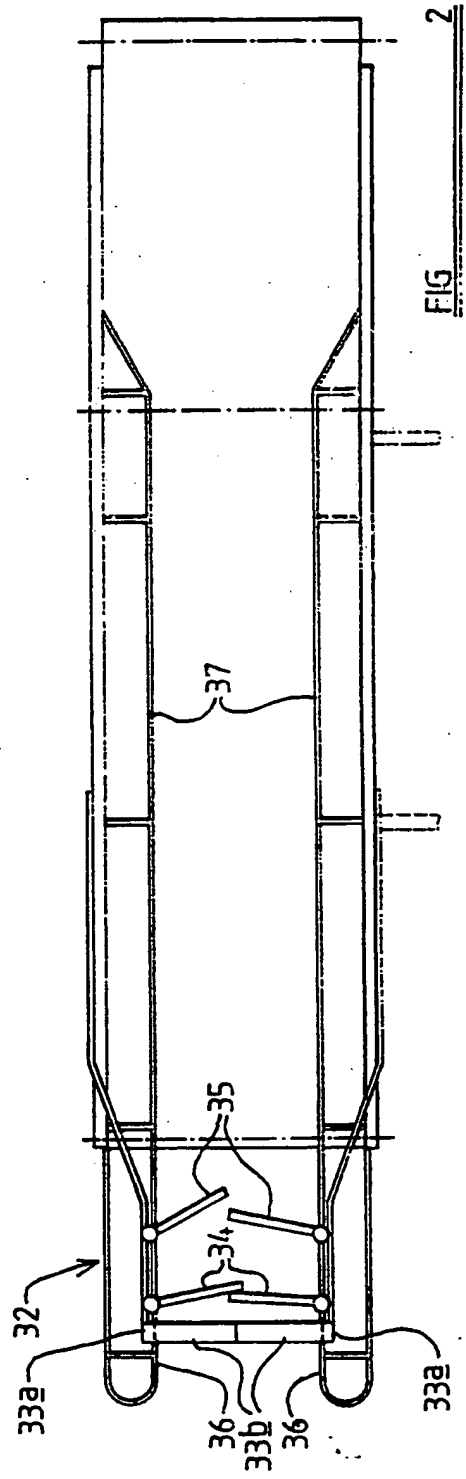
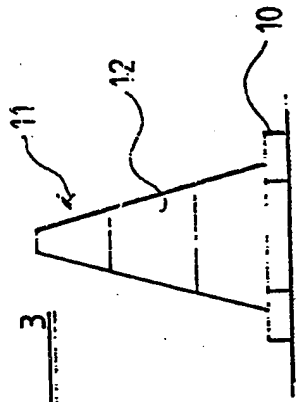


FIG. 2

FIG 3



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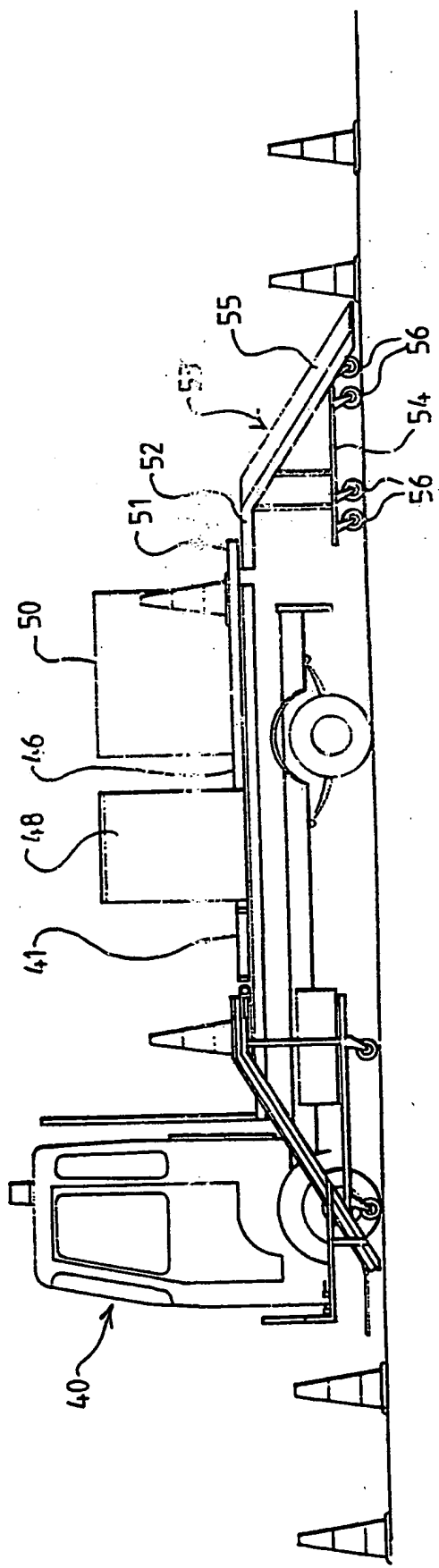


FIG 4

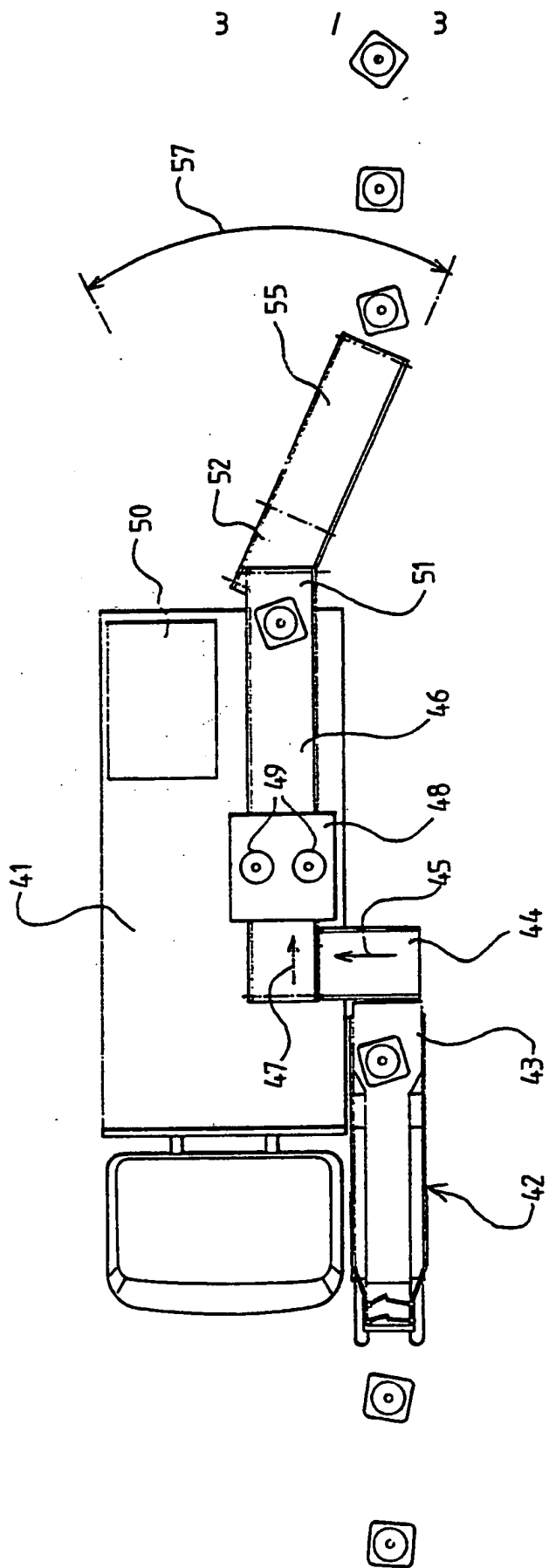


FIG 5

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Title: **HANDLING OF "TRAFFIC CONES"**

This invention relates to the handling of road traffic marker devices of the kind which are commonly, and will herein be, referred to as "traffic cones". A traffic cone comprises a base portion which is adapted to rest stably on a road surface, and a marker portion extending upwardly from the base portion. The marker portion, which commonly is conical thus giving rise to the name conferred on the device, is usually arranged to be highly visible to motorists, being of a bright colour or provided with a brightly coloured element. Reflective material designed to reflect the headlights of approaching vehicles to improve visibility of the marker device at night may be provided. It is to be understood that when we refer to traffic cones, we intend to include marker devices whose marker portion may be of other than conical configuration, e.g. pyramidal, and further that when we refer to a road surface we intend to include other surfaces on which such marker devices may be used for any reason.

Large numbers of traffic cones are used to delineate and direct flows of traffic at road construction or maintenance works. The manual setting out or collection of a large number of traffic cones, possibly numbering in the thousands at major road works on motorways, is extremely time consuming, and hazardous to personnel carrying out such operations because of traffic. Further, when traffic cones are in use on a busy road or motorway, particularly in wet conditions and owing to the possible presence of mud or loose earth at roadworks, the traffic cones quickly become covered in dirt and grime which detracts from their visibility.

Hence it would be beneficial if the setting out and collecting of traffic cones could be mechanised to reduce the need for manual handling thereof, and if there could be provided means for cleaning traffic cones. The present invention has been devised with such desiderata in view.

According to a first aspect of the invention, we provide apparatus for collecting traffic cones from a road surface, comprising conveyor means having a loading station and a discharge station, said loading station being disposed or arranged to be disposed adjacent the road surface to transport traffic cones from the road surface to the discharge station.

Preferably the apparatus comprises means for engaging traffic cones approached by the loading station of the conveyor means and adapted to orientate the cones such that they are able to be taken on to the conveyor at said loading station.

The conveyor means may comprise a conveyor belt which at its loading station passes around a guide means, e.g. a roller, which in use lies close and substantially parallel to the road surface. It will be appreciated that a traffic cone resting in its normal position on a road surface is not able to be taken on to such a conveyor belt, because even when the guide roller is as close as possible to the road surface, the carrying surface of the belt is spaced a significant distance above the road surface and thus the invention provides that there is the means for orientating the cones so that they are able to board the conveyor belt.

Preferably the means for orientating the cones comprises means engagable with the marker portions thereof as they are approached by the loading station of the conveyor means, to cause the cones to tilt in such a way that a part of the base portion thereof approaching the conveyor means is lifted away from the road surface and is thus able to be taken on to the conveyor belt.

The means for engaging the traffic cones to orientate them may comprise elements which are resilient and/or resiliently mounted and so disposed as to engage the cones to tilt them as necessary without knocking them over.

Such resilient and/or resiliently mounted elements may be provided in a guide means providing an entry path leading to the loading station of the conveyor means.

The conveyor means may be inclined so that its discharge station is at a higher level than its loading station. The height of the discharge station is

preferably selected so as to approximate to that of the load bed of a vehicle, e.g. a lorry, pick-up truck, or trailer, such as is commonly used by contractors carrying out road maintenance operations.

The apparatus for collecting cones may be provided with road wheels to support it for movement along a road surface, and preferably is adapted to be connected to a vehicle as aforesaid, to be moved with the vehicle as the vehicle is driven along the road.

According to a second aspect of the invention, we provide apparatus for setting traffic cones on a road surface, comprising conveyor means having a loading station and a discharge station, said discharge station being positioned or adapted to be positioned adjacent the road surface so as to set cones onto the road surface in their normal operative orientation.

Analogously to the discharge station of the apparatus for collecting cones, according to the first aspect of the invention, the loading station of the conveyor means of the apparatus for setting traffic cones on the road surface may be at a height above the road surface approximate to that of the load bed of a vehicle such as a lorry, the conveyor means being inclined downwardly from the loading station to the discharge station so that cones leaving the conveyor means do not drop through a large distance onto the road surface. Since the design of traffic cones is usually such that they are stable in use, the apparatus for setting traffic cones on the road surface should not require any means to be provided for guiding or orientating the cones as they leave the conveyor means to rest on the road surface.

The apparatus for setting the traffic cones may be provided with wheels for supporting it on a road surface and be adapted for connection to a vehicle so as to be moved along the road surface with the vehicle.

According to a third aspect of the invention, we provide apparatus for cleaning traffic cones, comprising a cleaning station provided with means for cleaning at least part of the marker portions thereof and conveyor means for transporting successive traffic cones through the cleaning station.

The means for cleaning the marker portions of the cones may comprise a brush or brushes engagable therewith, and there may further be provided means for supplying a cleaning fluid to the cones. The cleaning fluid may be water.

According to a fourth aspect of the invention, we provide a vehicle having apparatus according to at least one of the first, second and third aspects of the invention as above set forth. Preferably the vehicle is provided with apparatus according to all three aspects of the invention, namely apparatus for collecting cones from a road surface, apparatus for cleaning cones, and apparatus for setting cones on the road surface.

The vehicle may be self-propelled, e.g. a lorry, or may be adapted to be propelled by another vehicle, e.g. the vehicle may be a trailer.

In the case of a self-propelled vehicle, the apparatus for collecting the cones may be arranged so that its loading station is at a position visible by the vehicle's driver, and its discharge station is arranged to discharge collected cones onto a load bed of the vehicle.

Cones may be removed manually by an operator travelling on the load bed of the vehicle, or there may be a further cone handling means, e.g. a further conveyor means, for removing cones from the discharge station of the apparatus for collecting the cones.

The apparatus for setting the traffic cones on the road surface is preferably movable, e.g. pivotable, relative to the vehicle so that its discharge station is disposed so as to set the traffic cones at a selected position in the direction transversely of the vehicle.

The apparatus for cleaning the traffic cones may be disposed between the discharge station of the conveyor means of the cone collecting apparatus, and the loading station of the conveyor means of the cone setting apparatus, so that it is possible for cones to be collected, cleaned, and reset on the road surface, in such operation the cones being handled by successive conveyor means without requiring to be manually handled.

A vehicle according to the invention may be used in different modes.

It may be used for collecting cones from the road surface, the collected cones being stowed on the vehicle. It may be used for setting cones on the road surface from a quantity thereof stored on the vehicle. It may be used for collecting, cleaning and resetting cones as above described. Cones may be collected and reset in the same or a different position, in the direction transversely of the vehicle, on the road surface.

According to a fifth aspect of the invention, we provide a method of collecting traffic cones from a road surface, comprising approaching the cones with a loading station of a conveyor means, and transporting the cones by the conveyor means to a discharge station thereof. Preferably the cones are engaged with a means for orientating them so that they are able to be taken on to the conveyor means.

The cones may be tilted by the means for orientating them, to raise a part of the base portion of each cone to a height sufficient to be taken onto the conveyor means.

According to a sixth aspect of the invention, we provide a method of setting traffic cones on a road surface, comprising loading successive cones on a conveyor means at a loading station of the conveyor means and transporting the cones by the conveyor means to a discharge station thereof disposed in a required position adjacent the road surface.

According to a seventh aspect of the invention we provide a method of cleaning traffic cones comprising collecting traffic cones from a road surface, cleaning at least part of the marker portion thereof and resetting the cones on a road surface.

The collecting operation may be according to the fifth aspect of the invention and/or the setting operation may be according to the sixth aspect of the invention and/or the cleaning operation may comprise transporting successive traffic cones through a cleaning station provided with means for cleaning said at least part of the marker portions of the cones. The cleaning operation may

comprise performing a brushing operation on at said at least part of the marker portion of the cones and/or supplying a cleaning fluid such as water thereto.

According to an eighth aspect of the invention we provide a method of repositioning traffic cones on a road surface comprising collecting the traffic cones from the road surface with a vehicle moving along a line of cones and setting the traffic cones on to the road surface from the vehicle at a different position with respect to the transverse direction of the vehicle.

The method of the sixth and eighth aspects of the invention may be performed utilising a vehicle according to the fourth aspect of the invention.

The invention will now be described by way of example with reference to the accompanying drawings, of which:

Figures 1 and 2 are respectively a side elevation and plan view of a means for collecting cones from a road surface, in accordance with a first aspect of the invention;

Figure 3 is an elevation of a typical traffic cone with which the invention is usable;

Figure 4 is a side elevation of a vehicle according to the invention, equipped with cone collecting means, cone setting means, and cone cleaning means, all in accordance with the invention;

Figure 5 is a plan view of the vehicle of Figure 4.

Referring firstly to Figures 1 and 2 of the drawings, these illustrate apparatus for handling traffic cones of the type shown in Figure 3. The cone of Figure 3 comprises a base portion 10 and an upstanding marker portion 11 extending therefrom, the base portion 10 being generally rectangular in plan view with rounded corners and of a durable material, e.g. a suitable plastics material. The marker portion 11 is frusto-conical in shape and may be integral with or connected to the base portion. At least the marker portion 11 is of a bright colour, e.g. yellow or orange, to render it readily visible, and may have a reflective surface portion 12 provided thereon.

The apparatus of Figures 1 and 2 is dimensioned to co-operate as described hereafter with a typical traffic cone such as shown in Figure 3, and comprises a frame structure 14 which is provided with castor wheels 15 to support it on a road or other ground surface 16. The frame 14 includes an upstanding portion 17, and is arranged to support a conveyor means indicated generally at 18. The conveyor means 18 is of the type comprising an endless flexible belt guided by guide rollers, and includes an inclined portion 19 which extends upwardly from a guide roller 20 adjacent the road surface 16, and a substantially horizontal portion 21 at the uppermost end of the inclined portion 19. In Figure 1, the belt is indicated at 22 where it is entrained around a guide roller 23 at the end of the horizontal portion 21, and a guide roller 24 is shown at the underside of the conveyor belt at the transition from the inclined portion 19 to the horizontal portion 21, although it will be appreciated that in practice several more guide rollers will be provided in addition to those identified at 20, 23, 24.

The frame 14 further supports an engine 25, e.g. a diesel engine, driving an hydraulic pump 26 which draws hydraulic fluid by pipes 27 from a reservoir 28 and supplies such hydraulic fluid by way of a control device 29 to an hydraulic motor 30 for driving the roller 23 and thus the conveyor belt 22. The motor 30 is connected to the roller 23 by a transmission chain or belt 31, and provides for reversible driving of the conveyor belt at a speed which is infinitely variable within the operating speed range of the apparatus.

Instead of a diesel engine and hydraulic drive system for driving the conveyor belt, the apparatus could be provided with other types of driving mechanism. For example, an electric motor, which may be arranged to derive power from the electrical system of the vehicle with which the apparatus is to be used, could be provided.

Further possibilities are that a mechanical drive by way of a power take off shaft from the driveline of the vehicle could be provided, or the conveyor belt could be driven by a suitable transmission mechanism from a wheel engaging

the ground on which the apparatus is to be used, so that the apparatus is driven when the vehicle is moving over the ground.

The lowermost end of the inclined portion of the conveyor belt, at the guide roller 20, constitutes a loading station for the conveyor means. It will be appreciated, however, that if such lowermost end of the conveyor belt approaches and meets a traffic cone resting in its normal orientation on the road surface, such cone will not be taken on the board the conveyor belt but will merely be pushed over the road surface. To be taken on to the conveyor belt, the cone has to be orientated such that its base portion 10 can contact the conveyor belt immediately above the guide roller 20. For this purpose cone-orientating means is provided as indicated generally at 32.

The means indicated generally at 32 for orientating cones approached by the loading station at the lowermost end of the conveyor means comprises a frame 33 extending forwardly from the conveyor means, at a height slightly lower than the uppermost end of a typical cone. At its front end the frame has a guard frame comprising a pair of transversely spaced uprights 33a which are interconnected at their upper ends by inverted V-shaped members 33b. The frame carries a first pair of opposed pivotable arms 34 and a second pair of opposed pivotable arms 35 spaced from the arms 34. The arms 34, 35 are spring biased at their pivotal mountings on the frame 33, so that they normally meet one another as shown for the arms 34 but when they are approached and engaged by a cone they can deflect against their spring biasing as shown for the arms 35. The strength of the spring biasing of the arms 34, 35 is selected to be sufficient to tilt a cone engaged thereby, to lift the base portion 10 thereof away from the road surface sufficiently to clear the roller 20 at the lowermost end of the inclined portion 19 of the conveyor belt, so that the cone can be taken on to the conveyor belt to be carried thereby. At the same time, the strength of the spring biasing of the arms 34, 35, must not be too great or a cone will not pass therebetween. Instead of, or in addition to, the pivotable mounting and spring biasing of arms 34, 35, resilient arms, e.g. of rubber or other elastic material, may be used.

Below the frame 33 and the arms 35, there extend guide rails 36 which define an entry path to the conveyor belt, and are positioned so as to guide a cone by contacting its marker portion a short distance above its base portion 10. The guide rails 36 continue, as indicated at 37, up the inclined portion 19 of the conveyor belt and end slightly beyond the top of the inclined portion 19.

Referring now to Figures 4 and 5 of the drawings, these show a vehicle according to the invention, provided with apparatus as above described and also with further apparatus according to the invention. The vehicle is a conventional lorry having an engine and a driver's cab 40 and a load bed 41. Secured to the vehicle alongside its cab and to the front part of its load bed is apparatus as above described with reference to Figures 1 and 2 of the drawings. In Figure 5 such apparatus is indicated generally at 42. The loading station of the conveyor means of the apparatus 42, equipped with means for orientating cones to enable them to be carried onto and up the conveyor means of the apparatus, is positioned relative to the cab such that it is readily visible to the vehicle's driver. The apparatus 42 is supported on its own wheels, and is connected, by means not shown, to the chassis of the vehicle so as to be moved along the road with the vehicle as the vehicle is driven. Instead of being supported on its own wheels, the apparatus 42 could be supported by a suitable structure or linkage from the chassis of the vehicle or the load-carrying part thereof. A linkage may provide for lifting and lowering of the apparatus between operative and inoperative positions thereof.

The discharge station of the apparatus 42, constituted by the horizontal portion of the conveyor means at the top of the inclined portion 19 thereof, and identified by the reference numeral 43 in Figure 5 is approximately level with or slightly higher than the load bed 41 of the lorry. Whilst it would be possible for a person standing on the load bed of a lorry to remove cones manually from the discharge station 43 of the conveyor means of the apparatus 42, the illustrated vehicle has a further conveyor 44 provided adjacent the discharge station 43 and

operable to move cones transversely of the vehicle in the direction of arrow 45, towards the load bed thereof.

The conveyor 44 discharges cones on to a loading station of a further conveyor 46 which transports cones in the direction of arrow 47 and extends to the rear end of the load bed 41 of the lorry. The conveyor 46 transports cones through a washing station 48 which contains retractable rotating brushes 49 arranged to brush the marker portions of cones passing therebetween. The washing station 48 may also apply cleaning fluid, e.g. water to the cones to assist the cleaning thereof and may recirculate such water from a storage and recirculation tank 50 which is positioned on the lorry so as to balance the weight of the conveyor 46 and washing station 48. The conveyors 44, 46 may be hydraulically, electrically or mechanically driven, e.g. from a power source of the lorry.

The rearmost end, indicated at 51, of the conveyor 46 is positioned above the loading station 52 of a conveyor means of an apparatus indicated generally at 53 for setting cones on a road surface. The apparatus 53 is analogous in construction to the apparatus shown in Figures 1 and 2, comprising a frame 54 supporting a conveyor means with its horizontal loading station 52 and an inclined portion 55 extending downwardly to a position close to the road surface. The frame 54 is carried by castor wheels 56, and is connected, by means not shown, to the vehicle in such a way as to be swingable in an arc as indicated at 57 so as to discharge cones onto the road surface at a selected position in the direction transversely of the vehicle. As for the apparatus 42, the apparatus 53 may be supported by the vehicle instead of having its own supporting wheels 56. The conveyor means of the apparatus 53 may be powered in one of the manners described above in relation to the apparatus 42.

A vehicle equipped as above described may be used in different ways to perform operations commonly required in roadworks operations and which hitherto have been usually performed manually.

For example the vehicle may be driven so as to collect successive cones from a line thereof on a road surface as described hereinbefore. The thus collected cones may then be passed by conveyors 44 and 46 through the washing station 48 and then returned to the road in the washed condition by the conveyor 55. Such cones may be replaced in the same position in the direction transversely of the vehicle as they were picked up from or in another position transversely of the vehicle as determined by the setting of the conveyor 55.

Alternatively, the vehicle may be driven so as to collect successive cones from a line thereof on a road surface and if such cones are not required to be replaced they may be collected from the discharge station 43 of the apparatus 42 (or from the discharge end of the transverse further conveyor 44 if such conveyor is provided) and stacked on the load bed 41 of the vehicle.

Alternatively, cones previously stacked on the vehicle either by virtue of having been collected as described previously or by virtue of having been stacked on the vehicle in a separate operation may be placed on the road surface as the vehicle is driven along using the conveyor 55. Such cones may be passed through the washing station 48 prior to being set on the road surface. If it is not desired to wash the cones the brushes 48 may be retracted to allow passage of the cones through the washing station without washing.

Although the vehicle described hereinbefore is a lorry, if desired the vehicle may be a trailer adapted to be pulled by any suitable vehicle.

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS

1. Apparatus for collecting traffic cones from a road surface, comprising conveyor means having a loading station and a discharge station, said loading station being disposed or arranged to be disposed adjacent the road surface to transport traffic cones from the road surface to the discharge station.
2. Apparatus according to Claim 1 wherein the apparatus comprises means for engaging traffic cones approached by the loading station of the conveyor means and adapted to orientate the cones such that they are able to be taken on to the conveyor at said loading station.
3. Apparatus according to Claim 2 wherein the conveyor means comprises a conveyor belt which at its loading station passes around a guide means, which in use lies close and substantially parallel to the road surface.
4. Apparatus according to Claim 2 or Claim 3 wherein the means for orientating the cones comprises means engagable with the marker portions thereof as they are approached by the loading station of the conveyor means, to cause the cones to tilt in such a way that a part of the base portion thereof approaching the conveyor means is lifted away from the road surface and is thus able to be taken on to the conveyor belt.
5. Apparatus according to any one of Claims 2 to 4 wherein the means for engaging the traffic cones to orientate them comprises elements which are resilient and/or resiliently mounted and so disposed as to engage the cones to tilt them as necessary without knocking them over.

6. Apparatus according to Claim 5 wherein such resilient and/or resiliently mounted elements are provided in a guide means providing an entry path leading to the loading station of the conveyor means.
7. Apparatus according to any one of the preceding claims wherein the conveyor means is inclined so that its discharge station is at a higher level than its loading station.
8. Apparatus according to Claim 7 wherein the height of the discharge station is preferably selected so as to approximate to that of the load bed of a vehicle.
9. Apparatus according to any one of the preceding claims wherein the apparatus for collecting cones is provided with wheels to support it for movement along a road surface.
10. Apparatus according to Claim 9 wherein the apparatus is adapted to be connected to a vehicle so as to be movable by the vehicle.
11. Apparatus for collecting traffic cones from a road surface substantially as hereinbefore described with reference to the accompanying drawings.
12. Apparatus for setting traffic cones on a road surface, comprising conveyor means having a loading station and a discharge station, said discharge station being positioned or adapted to be positioned adjacent the road surface so as to set cones onto the road surface in their normal operative orientation.
13. Apparatus according to Claim 12 wherein the loading station is at a higher level than the discharge station.

14. Apparatus as claimed in Claim 13 wherein the conveyor means is inclined downwardly from the loading station to the discharge station.
15. Apparatus according to Claim 14 wherein the height of the loading station is selected so as to approximate to that of the load bed of a vehicle with which the apparatus is used.
16. Apparatus according to any one of the preceding claims wherein apparatus is provided with wheels to support it for movement along a road surface.
17. Apparatus as claimed in Claim 16 wherein the apparatus is adapted to be connected to a vehicle so as to be movable by the vehicle.
18. Apparatus for setting cones on a road surface substantially as hereinbefore described with reference to the accompanying drawings.
19. Apparatus for cleaning traffic cones, comprising a cleaning station provided with means for cleaning at least part of the marker portions thereof and conveyor means for transporting successive traffic cones through the cleaning station.
20. Apparatus according to Claim 19 wherein the means for cleaning the marker portions of the cones comprises a brush or brushes engagable therewith.
21. Apparatus as claimed in Claim 20 wherein there is provided means for supplying a cleaning fluid to the cones.
22. Apparatus according to any one of Claims 19 to 21 wherein the apparatus is provided with wheels to support it on a road surface.

23. Apparatus according to Claim 22 wherein the apparatus is adapted to be connected to a vehicle so as to be movable by the vehicle.
24. Apparatus for cleaning traffic cones substantially as hereinbefore described with reference to the accompanying drawings.
25. Apparatus according to any one of Claims 1 to 11 and/or Claims 12 to 18 and/or claims 19 to 24 when provided on a vehicle.
26. Apparatus according to Claim 25 wherein the vehicle is self-propelled.
27. Apparatus according to Claim 25 wherein the apparatus is adapted to be propelled by another vehicle.
28. Apparatus according to Claim 26 wherein the apparatus for collecting the cones is arranged so that its loading station is at a position visible by the vehicle's driver, and its discharge station is arranged to discharge collected cones onto a load bed of the vehicle.
29. Apparatus according to any one of Claims 25 to 28 wherein cones are removable manually by an operator travelling on the load bed of the vehicle.
30. Apparatus according to any one of claims 25 to 28 wherein there are further cone handling means for removing cones from the discharge station of the apparatus for collecting the cones.
31. Apparatus according to any one of Claims 28 to 30 wherein the apparatus for setting the traffic cones on the road surface is movable relative to the vehicle so that its discharge station is disposed so as to set the traffic cones at a selected position in the direction transversely of the vehicle.

32. Apparatus according to any one of Claims 25 to 31 wherein the apparatus for cleaning the traffic cones is disposed between the discharge station of the conveyor means of the cone collecting apparatus, and the loading station of the conveyor means of the cone setting apparatus, so that it is possible for cones to be collected, cleaned, and reset on the road surface, in such operation the cones being handled by successive conveyor means without requiring to be manually handled.

33. Apparatus according to any one of Claims 1 to 11, and/or Claims 12 to 18 and/or Claims 19 to 24 when provided on a vehicle substantially as hereinbefore described with reference to the accompanying drawings.

34. A method of collecting traffic cones from a road surface, comprising approaching the cones with a loading station of a conveyor means, and transporting the cones by the conveyor means to a discharge station thereof.

35. A method according to Claim 34 wherein the cones are engaged with a means for orientating them so that they are able to be taken on to the conveyor means.

36. A method according to Claim 35 wherein the cones may be tilted by the means for orientating them, to raise a part of the base portion of each cone to a height sufficient to be taken onto the conveyor means.

37. A method of collecting traffic cones substantially as hereinbefore described with reference to the accompanying drawings.

38. A method of setting traffic cones on a road surface, comprising loading successive cones on a conveyor means at a loading station of the conveyor means

and transporting the cones by the conveyor means to a discharge station thereof disposed in a required position adjacent the road surface.

39. A method of setting traffic cones on a road surface substantially as hereinbefore described with reference to the accompanying drawings.

40. A method of cleaning traffic cones comprising collecting traffic cones from a road surface, cleaning at least part of the marker portion thereof and resetting the cones on a road surface.

41. A method of cleaning traffic cones substantially as hereinbefore described with reference to the accompanying drawings.

42. A method comprising a collecting operation according to any one of Claims 34 to 37 and/or a setting operation according to Claim 38 or Claim 39 and/or a cleaning operation according to Claim 40 comprising transporting and forwarding successive traffic cones through a cleaning station provided with means for cleaning said at least part of the marker portions of the cones.

43. A method according to Claim 42 wherein the cleaning operation comprises performing a brushing operation on at said at least part of the marker portion of the cones and/or supplying a cleaning fluid such as water thereto.

44. A method of repositioning traffic cones on a road surface comprising collecting the traffic cones from the road surface with a vehicle moving along a line of cones and setting the traffic cones on to the road surface from the vehicle at a different position with respect to the transverse direction of the vehicle.

45. A method of repositioning traffic cones substantially as hereinbefore described with reference of the accompanying drawings.

46. A method according to Claims 37 and 38 performed utilising an apparatus according to any one of Claims 25 to 33.

47. A method according to Claim 45 or Claim 46 performed utilising an apparatus according to any one of claims 25 to 33.

48. Any novel feature or novel combination of features disclosed herein and or in the accompanying drawings.

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Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

GB 9215331.1

Relevant Technical fields

(i) UK Cl (Edition L) E1G

(ii) Int Cl (Edition 5) E01F

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

D HAWORTH

Date of Search

11 OCTOBER 1993

Documents considered relevant following a search in respect of claims 1-18, 25-31, 34-39 and 44-47

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2240126 A (ADDCO)	1,12,25 and 34 at least
X	GB 2175336 A (CLARK)	12-17 and 31 at least
X	US 4597706 A (MICHIT)	1,12,25, 34 and 44 at least

Category	Identity of document and relevant passages - 20 -	Relevant to claims

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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